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ABSTRACT

The difficulty of obtaining usable information about the mental processes involved in the use of language has been a major obstacle in the design of effective writing programs. The antipsychological, behavioristic bias of American linguistics, which prevented any study of the deeper mental processes of language production, was remediated in part by the evolution of transformational grammar, although the preoccupation was still with syntactic formation rather than with thoughts and their expression. Recent investigations in psychological research have been more promising with regard to their applicability to teaching language skills. (1) Syntax plays a limited role in the processing of language, being applied late in text production and soon forgotten in text comprehension. (2) Grammatical decisions in the formation of a single sentence cannot be made without knowledge of the overall flow of the text. (3) The concept of "frame" is now being used to classify the shared knowledge, beliefs, and attitudes prerequisite to communication; into this field the individual introduces nonexpected material in the form of news or opinion. (4) Effective writing proceeds when the writer achieves the optimum balance between what the reader already knows and what he or she is now being told. (5) Finally, good writing is not inventive, but recombinational. (DS)

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THE PSYCHOLOGY OF LANGUAGE AND THE TEACHING OF ENGLISH

Robert de Beaugrande

One of the major obstacles in designing effective writing programs is the difficulty of obtaining reliable and useable information about the mental processes involved in the use of language. It is not surprising that composition specialists are turning frequently to psychology in search of enriching insights.

Though the boundary is not always distinct, it is necessary to differentiate between psychology and psycholinguistics. The latter, especially in America, has pursued a specialized interest in investigating the psychological reality of linguistic models and concepts. A.A. Leontev has described American psycholinguistics in fact as "anti-psychological"; it is undeniable that cooperation between the two fields has been amazingly slight.[1] This apparent paradox derives from the long-standing mistrust among linguists of what Leonard Bloomfield once condemned as "mentalism."[2] Directly in the behaviorist tradition, Bloomfield offered as an account of meaning a strict stimulus-response model. A speaker was said to receive some outer stimulus from the environment and to "respond" by producing an utterance; the latter in turn becomes the stimulus for another speaker who "responds" and so on. Meaning was thus impoverished as the response which a language item elicits. Since no way was obvious to catalogue human situations as accurately and exhaustively as the minimal units of sound (phonemes) and form (morphemes) of a language, post-Bloomfieldian linguistics long excluded the study of meaning altogether. This attitude precluded any extensive cooperation with psychology during the 1930's and 1940's.

In the 1950's, behaviorist psychology began to take a greater interest in

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language. This trend was due partly to the rise of statistical information theory, and partly due to the development of "mediation theories" sufficiently complex to admit the non-observable processes of language. The technical terms "encoding" and "decoding" were taken from information theory and assigned to the newly created field of "psycholinguistics" as the object of study.[3] The "code" itself was reserved for the linguists proper, thus assuring the dominance of the latter over psycholinguistics, as I mentioned above.

During that early period, language investigations were largely of the associative type in psychology. The experimenter would "stimulate" test subjects with a word or nonsense sound from a list and the subject would "respond" by giving some "associated" word or by rating the original stimulus on some scale of "meaning."[4] Such procedures may discover something about the way people react to certain words or sounds in isolation (though we are never told quite why). But they tell us little about how real speech and writing, that is: words arranged in special ways, affect people. Thus, the teacher of writing cannot profit much from such studies.

A change occurred through the progressive evolution of transformational grammar, which soon began to dethrone post-Bloomfieldian linguistics. The original model published in 1957 (Noam Chomsky's Syntactic Structures) was composed of a set of quasi-mathematical procedures for representing syntactic relationships between sentences. Simple sentences, known as "kernels," were to be "transformed" by a series of ordered operations into more complex ones. Meaning figured only as the set of "restrictions" upon a given item regarding the combinations it could form with other items. Several years later, two of Chomsky's followers proposed that meaning be treated as a system of underlying "semantic features" which -- not surprisingly -- bore a strong family resemblance to those minimal units of sound and form so well known in

phonology and morphology.[5]

Shortly afterwards, Chomsky published a remarkably "mentalistic" version of his model (Aspects of the Theory of Syntax, 1965). The new version differed from the old less in its construction than in its claims about what it was intended to explain. Instead of showing syntactic relationships between sentences, it now claimed to account for nothing less than the "competence" of speakers to use their own language. The erstwhile "kernels" were styled "deep structures" (though there was some vague difference) which, by application of formative and transformative rules, evolved into actual utterances, henceforth known as "surface structures." Meaning was admitted in the form of predicate logic, which meant that deep structures had to have a syntax compatible with simple predications (x is y or x does y to z). The logical and the syntactic senses of the term "predicate" became hopelessly confused with each other.

In comparison to post-Bloomfieldian linguistics, Chomsky's model was clearly much more attractive to psychologists. Chomsky's followers were quite unreserved in their fervent belief in the mental reality of the model, as shown by this extreme example (which I would like to think is intended facetiously!):

> If we open up a human being, what do we find inside? . . . We find a four-chambered heart, a spine, some intestines, and a transformational grammar with two or more syntactic levels.[6]

Research began forthwith to prove that people actually generate utterances in the same way the grammar did: by starting off with a deep structure (an elementary declarative sentence) and producing all other types of sentences by transformations, such as negations, questions, commands, and so on. Experiments consisted of having subjects process (or, less often, produce) sentences, while the experimenter measured the time needed for the task ("latency time"). Time was compared to predictions formed by counting the transformations required by the grammar to generate the same sentences, or to

transform them back to their respective "deep structures." The results obtained were at best equivocal, as even Chomsky's followers eventually admitted; the time elapses were probably attributable to internal compatability of meanings, as I shall explain further on.[7]

There were of course other tests -- the most famous being the insertion of "clicks" into recorded sentences to find out how hearers sorted words into syntactic groups -- but they all inherited the flaws built into the original model. It is simply unrealistic to assume that real speakers and hearers are especially concerned with syntactic formation rather than with getting something across. The preoccupation with syntactic and logical well-formedness and with keeping the ideal language ("competence") separate from the real one ("performance") meant replacing human language with a synthetic substitute. As a result, linguists tended to regard language use as something inferior and deformed by the efforts of people to give prominence to their main concerns and to downplay insignificant material. This attitude is revealed here:

> But after these focusing and compression devices have worked their destructive way, some restitution must be made if only to give the hearer at least a 50-50 chance of reconstructing the meaning of the sentence, the underlying Logical Form.[8] [my emphasis]

Even though it failed to live up to its high claims,[9] transformational grammar brought a lasting contribution to the psychology of language through its insight that observable language behavior is only a surface manifestation of deeper mental processes -- something that American linguists and psychologists had long preferred to ignore. Its contribution to the composition class was the activity known as "sentence-combining," during which students actually do apply at least some transformations to simpler sentences. Although not available at the time when this activity was introduced, there is some psychological evidence that complexity of language used is positively correlated with communicative involvement and cognitive maturity.[10]

Controversy about the all-important notion of "deep structure" continues. Many linguists and psychologists now agree that it must be based upon meaning, not syntax. Two major attempts at such a revision came from within the transformational school itself. Firstly, Fillmore's case grammar replaced the purely syntactic categories with relational ones. Thus the grammatical subject might well turn out to be the instigator of an action (agent), the recipient of the action (patient), the one profiting by the action (benefiter), the means used (instrument), the place of the action (locative), and so on.[11] Secondly, generative semantics took the logical predication of the sentence, together with its presuppositions, as a deep structure which only subsequently received a syntactic formation. Thus the semantic component became generative and the syntactic one interpretative -- just the reverse of the standard model. The proponents of such a generative semantics could easily show that many syntactic decisions could not be made until the priorities depending upon presupposition, reference, and focus had been established. Chomsky responded by admitting the importance of such factors, but he still considers them "surface"phenomena.[12]

The general trend both in linguistics and psychology is now away from the standard model of transformational grammar toward language philosophy and logic. Among the most important work in this area is that of Walter Kintsch and Bonnie Meyer who tested the notion that language is produced and processed on the basis of predications (or in their terminology: propositions). Such investigations have added further support to the accruing evidence that syntax plays a limited role, being applied late during text production and soon forgotten in text comprehension.[13]

Approaches based on logic are no longer compelled to remain within the once obligatory boundaries of the single sentence. Teun A. van Dijk has

marshalled an impressive series of arguments in favor of text linguistics as opposed to sentence linguistics by showing how even the most basic grammatical decisions cannot be made without an awareness of the overall flow of the text. He interpreted "deep structure" as a large scale plan or "macro-structure" that controls the detailed formation of the "micro-structures" of the actual text. Conversely, the reading of a text entails the formation of "macro-structures" out of the material presented.[14]

I would now like to pursue this direction in psychological research, since it is by all accounts the most promising for applicability to teaching language skills. In agreement with recent research, we can assume that language use is not adequately representable by exact abstract rules, but only by flexible strategies whose activation and application is sensitive to the prevailing conditions of communicative situations. These strategies can be said to operate at various levels, which are classes of mental activities being applied to appropriate tasks. Such flexibility makes research much more intricate than for simplistic approaches, but anything less would be unrealistic.[15]

The traditional model of communication with a sender, a message, and a receiver is, from a psychological standpoint, either trivial or downright misleading, depending on the claims advanced for it. It tends to eradicate the highly creative aspects going on at the receiving end, and to downplay the significant pre-conditioning that is demanded for each particular message to be successfully imparted. In social psychology and artificial intelligence research, the concept of the frame is now widely used to classify the knowledge, beliefs, and attitudes that serve as the prerequisites of communication.[16] These frames serve to control the constant formation of expectations during discourse. Communicants are constantly matching the actual input with the activated frames; if the match is not good, the reader or hearer may modify or replace the frames, or else a miscue may occur.

Due to the wide variety of possible topics and their implications, the management of frames is in itself a remarkable activity. More creative are the activities for processing non-expected material. Communicants are constantly attempting to modify the beliefs and attitudes of other people, and such a goal can only be obtained by introducing into the discourse at least some non-expected material. We can envision a broad spectrum of agreement and intention, ranging from intimate conversations which presuppose substantial frame agreement and are oriented toward the sharing of current experience, over to heated political debates where complete disagreement of frames is both presupposed and maintained for the purpose of winning material support from persons other than the speakers. It is clear that the power to establish the frames applicable to communicative acts means substantial control over other participants in these acts: those who have this power determine what can be mentioned and presupposed at the outset, and hence, what conclusions can be reached.

In addition to frames, which are "fuzzy sets" of knowledge and belief, language users have recourse to patterns of arrangement called "schemas." Walter Kintsch has been able to show that even young children reconstruct stories on the basis of simple schemas.[17] Now if children who acquire language ability are in fact acquiring the techniques of using frames and schemas, we must revise traditional views about language acquisition. Piaget maintained that children progress from an early phase of egocentric language use toward a social use, while Vygotsky argued that children are first exposed to language through socialization and only then do they individualize it for themselves. But since frames and schemes would be inaccessible and useless without both individual and social applicability this quarrel seems to miss the point. Egocentricity motivates the acquistion and alignment of frames through socialization because personal goals cannot otherwise be attained.

Effective writing cannot succeed unless the writer makes shrewd predictions about the frames and schemas internalized by the prospective reader audience, and skillfully weaves into this background the elements which are essential to the motivation underlying the act of writing. It will not do to depart too radically from the anticipated background (at least for most audiences), since the text then becomes psychologically disturbing if not incomprehensible when frame assignment is continuously prevented. On the other hand, too strict adherence to frames makes the text trite and reader interest flags. Thus, training in writing rests upon learning to measure and control the rate and the means for weaving new material into the background of the material which the readers have already accepted as valid.

It follows that experiments concerning what readers notice and remember in texts must be revealing for a methodology of teaching writing. Language material of a concrete nature, i.e. the kind that readily allows the formation of imagery, is easily remembered by virtue of this property, while language material of an abstract nature must be stored with greater reliance upon its linguistic features.[18] Bizarre, non-expected images are more effective and acceptable than bizarre uses of abstract language, because of the more direct integration of the former into the reader's mental activities. Tests show that both expected and non-expected material is remembered, but it is possible that there are different processes at work. Expected material is easily integrated into the frame background, and its retention demands little effort. Non-expected material is retained by virtue of its differentness and the special effort needed to process it (the so-called "von Restorff effect") Poetry is memorable because there are very dense formal schemes and topic frames applicable to it, but also because of its unconventional language.

I spoke before of the process of comprehending a text as involving the formation of macro-structures which compress the content of the text. This

activity, which is apparently quite fast and efficient (at least in comparison to the usual abilities of people to compose verbal summaries), comprises at least generalization and deletion. Generalization is hierarchical in nature, since detailed material is subsumed under more general headings. Deletion can apply to material which is at least approximately recoverable, because it is readily associated with the retained material, or to accidental properties and details which the readers deem unessential. The role of frames and schemas is important here, but writers can exercise special control with focusing devices.[19]

Some intriguing research is available on the function of various parts of speech in such a model of language use as I have sketched out here. To the extent that their content is presumed to be non-expected, noun phrases are likely to receive more detailed modification. The same factor determines the order of attributive adjectives and also whether attributive or predicate position is selected. Non-expected properties are likely to be cited in predicate position. Adjectives closely associated with their nouns are prone to appear immediately before the latter, while adjectives that distinguish their nouns from among a set of alternatives appear before both the noun and the closely associated adjectives. Psychologists have reasoned that the adjectives closest to their nouns are selected first, which means that the left-to-right sequence of a noun phrase may be reversed in mental planning. The noun acts as a means of integrating the adjectives and determining what aspects of their potential descriptiveness are relevant in a given instance. Since such integration would be hindered by non-expected adjectives, predicate position is more suitable for these.[20] We can correlate these findings with the remarks made on complexity above. When a writer wishes to intensify the involvement of readers such that they can integrate something unfamiliar into their knowledge, complexity is increased through the number of modifiers

and variation in their positioning.

Psychologists have also noticed that among the major parts of the sentence, subjects seem to be remembered best, objects second best, and verbs the worst.[21] These results may be unreliable unless we examine and control the factor of internal compatability. For example: is the action expressed by the verb readily associated with its subject and object or not? The compatability criterion seems to apply more strongly to verb-object than to verb-subject combinations. Also, the verb is likely to be a relational word which organizes the nouns in the sentence and thus is itself not precisely remembered, but displaced by its function. And imagery is often more readily available for nouns than verbs for the same reason.

At any rate, psychologists have come to suspect that the conventional static viewpoint of word meanings as ascertainable from a dictionary is inadequate. Words appear to carry very detailed instructions about how they are to be used, and to behave very differently in different surroundings. Hans Hörmann, a well-known German psycholinguist, suggests that word meanings be envisioned not as units, but as vectors pointing toward the elements of their contexts of use. Texts would not then have meaning by virtue of their individual component words. Meaning is a dynamic construct of the reader who matches the vectors of components and creates compatability and consistency of sense in that way.[22]

If this is true, then the skill of good writing is not so much inventive in the traditional sense (e.g. the "Pentad" proposed by Burke), but rather recombinational. The task is not so much finding material as determining how it should be combined with respect to the reading activities among the prospective audience. Some combinations must be expected, and others, which must be selected with great care, non-expected. The involvement of the readers will be higher for the latter, but only if the new combinations are compelling, that is: if convincing motivations can be discovered for

them by passing through additional, deeper levels of mental activity. For example, when a metaphor occurs by substituting one designation where another one is expected, a writer cannot simply substitute a random word: there must be some discoverable and hence meaningful motive for the substitution. In the terms of Hörmann's system: the new constellation of vectors points the reader toward an enriching discovery.

We can conclude that the ultimate rationale for the study of literature and for training in writing has solid psychological support. In his latest book, Wolfgang Iser has defined literature as a text type whose reading is a process of the reorganization of knowledge and experience.[23] The very differences between the world of the text and the world surrounding the reader motivate the dynamic, constructive activities of reading. Far from being a preoccupation with a world of useless fantasy, the study of literature is indispensible for understanding the organization of the real world. By the same token, training in original writing brings the awareness of hitherto undetected frames and schemas and hence the ability to escape their dominance and envision better alternatives of experience and discovery.

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Notes

[1] A.A. Leontev made this statement in his speech "Soviet Psycholinguistics: New Trends" at the 20th International Congress on Psychology in Tokyo, 1972. Walter Kintsch, whose work will be treated later, voices the same complaint in the opening chapter of The Representation of Meaning in Memory (Hillsdale, N.J.: Erlbaum, 1974), pp. 1-6.

[2] Leonard Bloomfield, Language (New York: Holt, 1933).

[3] The first survey of the new field was Charles E. Osgood and Thomas Sebeok (eds.), Psycholinguistics, a special issue Nr. 49 of the Journal of Abnormal Social Psychology, 1954.

[4] A sample with nonsense syllables is Clyde E. Noble, "An Analysis of Meaning," Psychological Review, 59 (1952), pp. 421-30. The rating of words on scales of "semantic differential" is reported especially in Charles E. Osgood, George Suci, and P.H. Tannenbaum, The Measurement of Meaning (Urbana: University of Illinois Press, 1957).

[5] Jerrold J. Katz and Jerry Fodor, "The Structure of Semantic Theory," Language, 39 (1963), pp. 170-210.

[6] Ray S. Jackendoff, Semantic Interpretation in Generative Grammar (Cambridge, Mass.: MIT Press, 1972), p. 386.

[7] This admission is to be found in Jerry Fodor, Thomas Bever, and Merrill Garrett, The Psychology of Language (New York: McGraw-Hill, 1974), p. 368. For instance, the difficulties associated with the passive versus the active were identified as due to compatability by Dan Slobin, "Grammatical Transformations and Sentence Comprehension in Childhood and Adulthood," Journal of Verbal Learning and Verbal Behavior, 5 (1966), 219-27.

[8] Robert P. Stockwell, Foundations of Syntactic Theory (Englewood Cliffs, N.J.: Prentice-Hall, 1977), p. 168.

[9] A linguistic refutation is provided by Eugene M. Uhlenbeck, Critical Comments on Transformational Generative Grammar (The Hague: Smits, 1973), while a philosophical refutation is offered by Ian Robinson, The New Grammarian's Funeral (New York: Cambridge, 1975). Research raising psychological objections is listed in note 14.

[10] C.B. Cazden, "The Situation: A Neglected Source of Social Class Differences in Language Use," Journal of Social Issues, 26 (1970), 35-60; Eve Clark, "Non-Linguistic Structures and the Acquisition of Word Meaning, Cognition, 2 (1973), 161-82; Steven Kuczay, "On the Acquisition of a Semantic System," Journal of Verbal Learning and Verbal Behavior, 14 (1975), 340-58.

[11] Charles Fillmore, "The Case for Case," Universals in Linguistic Theory, ed. Emmon Bach and Robert Harms (New York: Holt, Rinehardt and Winston, 1968), 1-88. The suggestion that cases might constitute a psychological system is

not new, having been suggetsed by Wilhelm Wundt in 1900 and Karl Bühler in 1934. See now: M. Shafto, "The Space for Case," Journal of Verbal Learning and Verbal Behavior, 12 (1973), 551-62.

[12] This debate is documented in the contributions by Chomsky, George Lakoff, and James McCawley in Semantics, ed. Danny D. Steinberg and Leon A. Jakobovits (New York: Cambridge, 1971).

[13] Cf. Kintsch, Representation; Bonnie F. Meyer, The Organization of Prose and its Effects on Memory (Amsterdam: North Holland, 1975); J.D. Bransford, J.R. Barclay and J.J. Franks, "Sentence Memory: A Constructive versus Interpretive Approach," Cognitive Psychology, 3 (1972), 193-209; R.P. Honeck, "Interpretive versus Structural Effects on Semantic Memory," Journal of Verbal Learning and Verbal Behavior, 12 (1973), 448-55.

[14] Cf. Teun A. van Dijk, Some Aspects of Text Grammars (The Hague: Mouton, 1972); Teun van Dijk and Walter Kintsch, "Cognitive Psychology and Discourse: Recalling and Summarizing Stories," Current Trends in Text Linguistics, ed. Wolfgang Dressler (New York: de Gruyter, 1977)

[15] F.I.M. Craik and R.S. Lockhart, "Levels of Processing: A Framework for Memory Research," Journal of Verbal Learning and Verbal Behavior, 11 (1972) 671-84; J.L. Mistler-Lachmann, "Levels of Comprehension in Processing of Normal and Ambiguous Sentences," Journal of Verbal Learning and Verbal Behavior, 11 (1972), 614-23; D.W. Green, "The Effects of Task on the Representation of Sentences," Journal of Verbal Learning and Verbal Behavior, 14 (1975), 275-83; P.A. Carpenter, "On the Comprehension, Storage, and Retrieval of Comparative Sentences," Journal of Verbal Learning and Verbal Behavior, 13 (1974), 401-11.

[16] Erving Goffman, Frame Analysis (New York: Harper and Row, 1974); Marvin Minsky, "A Framework for Representing Knowledge," The Psychology of Computer Vision, ed. Patrick H. Winston (New York: McGraw-Hill, 1975), 211-80.

[17] Walter Kintsch, "On Comprehending Stories," Presentation at the Carnegie Symposium on Cognition, Pittsburg, 1976 (proceedings to appear shortly); see also van Dijk's presentation "Macro-Structures and Cognition" at the same conference.

[18] A. Paivio and I. Begg, "Imagery and Comprehension Latencies as a Function of Sentence Concreteness and Structure," Perception and Psychophysics, 10 (1971), 408-12.

[19] Cf. Robert de Beaugrande, "Information and Grammar in Technical Writing, CCC, 28/4 (December, 1977) 325-332. For a more comprehensive treatment of frames versus focus, see Robert de Beaugrande, "Information, Expectation, and Processing," Poetics, 7/1 (Spring 1978), 3-44.

[20] Charles E. Osgood, "Where do Sentences Come From?" Semantics, ed. Danny D. Steinberg and Leon A. Jakobovits (New York: Cambridge, 1971), 497-529; R. Rommeveit and E.A. Turner, "A Study of "Chunking" in the Transmission of Messages," Lingua, 18 (1967), 337-51; J.E. Martin, "Semantic Determinants of Preferred Adjective Order," Journal of Verbal Learning and Verbal Behavior, 8 (1969), 697-704; J.H. Danks and M.A. Schwenk, "Prenominal Adjective Order and Communication Context," Journal of Verbal Learning and Verbal Behavior, 11 (1972), 183-87.

[21] L.M. Horovitz and L.S. Prytulak, "Reintegrative Memory," Psychological Review, 76 (1969), 519-31; C.T. James, "Theme and Imagery in the Recall of Active and Passive Sentences," Journal of Verbal Learning and Verbal Behavior, 11 (1972), 205-11; for studies using the compatability principle advocated here, see D.E. Kanouse, "Verbs as Implicit Quantifiers," Journal of Verbal Learning and Verbal Behavior, 11 (1972), 141-47; J. Engelkamp, "The Interaction of Semantic Features of Transitive Verbs and Their Objects," Psychological Research, 37 (1975) 299-308.

[22] Hans Hörmann, Meinen und Verstehen. (Frankfurt Suhrkamp, 1976)

[23] Wolfgang Iser, Der Akt des Lesens (Munich: Fink, 1976). Prof. Iser tells me that an English version will appear shortly.